

Claims

1. A method for operating a fuel metering system (11) of a direct-injection internal combustion engine (1), having a fuel supply container (12), at least one prefeed pump (13) for pumping fuel out of the fuel supply container (12) into a low-pressure region (ND) of the fuel metering system (11), a high-pressure pump assembly having at least two high-pressure pumps (14, 15) for pumping fuel out of the low-pressure region (ND) into at least one high-pressure reservoir (16; 16', 16''), a control unit (22) for regulating an injection pressure (p_r) prevailing in the high-pressure reservoir (16; 16', 16''), and having fuel injection valves (9) for injecting fuel out of the high-pressure reservoir (16; 16', 16'') into combustion chambers (4) of the engine (1), characterized in that the fuel metering system (11) has one fuel circuit for metering fuel into all the combustion chambers (4) of the engine (1), and all the high-pressure pumps (14, 15) are disposed in the fuel circuit, and that all the high-pressure pumps (14, 15) are triggered independently of one another via a common pressure regulating circuit.

2. The method of claim 1, characterized in that the high-pressure pumps (14, 15)

are triggered parallel to one another.

3. The method of claim 1, characterized in that one or more first high-pressure pumps (14) are triggered oppositely from one or more second high-pressure pumps (15).

4. The method of one of claims 1-3, characterized in that the high-pressure pumps (14, 15) are triggered with the same triggering time (T).

5. A fuel metering system (11) of a direct-injection internal combustion engine (1), having a fuel supply container (12), at least one prefeed pump (13) for pumping fuel out of the fuel supply container (12) into a low- pressure region (ND) of the fuel metering system (11), a high-pressure pump assembly having at least two high-pressure pumps (14, 15) for pumping fuel out of the low-pressure region (ND) into at least one high-pressure reservoir (16; 16', 16''), a control unit (22) for regulating an injection pressure (p_r) prevailing in the high-pressure reservoir (16; 16', 16''), and having fuel injection valves (9) for injecting fuel out of the high-pressure reservoir (16; 16', 16'') into combustion chambers (4) of the engine (1),

characterized in that the fuel metering system (11) has one fuel circuit for metering fuel into all the combustion chambers (4) of the engine (1), and all the high-pressure pumps (14, 15) are disposed in the fuel circuit, and that the control unit (22) includes one pressure regulating circuit for all the high-pressure pumps (14, 15), and the high- pressure pumps (14, 15) are triggerable independently of one another via the pressure regulating circuit.

6. The fuel metering system (11) of claim 5, characterized in that the high-pressure pump assembly has two high-pressure pumps (14, 15).

7. The fuel metering system (11) of claim 5 or 6, characterized in that the control unit (22) triggers the high-pressure pumps (14, 15) parallel to one another.

8. The fuel metering system (11) of claim 5 or 6, characterized in that the control unit (22) triggers one or more first high-pressure pumps (14) oppositely from one or more second high-pressure pumps (15).

9. The fuel metering system (11) of one of claims 5-8, characterized in that the

control unit (22) triggers the high-pressure pumps (14, 15) with the same triggering time (T).

10. A fuel metering system (11) of a direct-injection internal combustion engine (1), which includes a fuel supply container (12), at least one prefeed pump (13) for pumping fuel out of the fuel supply container (12) into a low- pressure region (ND) of the fuel metering system (11), a high-pressure pump assembly having at least two high-pressure pumps (14, 15) for pumping fuel out of the low-pressure region (ND) into at least one high-pressure reservoir (16; 16', 16''), a control unit (22) for regulating an injection pressure (p_r) prevailing in the high-pressure reservoir (16; 16', 16''), and fuel injection valves (9) for injecting fuel out of the high-pressure reservoir (16; 16', 16'') into combustion chambers (4) of the engine (1), characterized in that the fuel metering system (11) is embodied in accordance with one of claims 5-9.

11. The engine (1) of claim 10, characterized in that the engine (1) has at least six cylinders (3).

12. The engine (1) of claim 10 or 11, characterized in that the fuel metering system (11) has two high-pressure reservoir regions (16', 16''), which communicate with one another via a pressure equalization line (26).

13. A control unit (22) for a fuel metering system (11) of a direct-injection internal combustion engine (1), which includes a fuel supply container (12), at least one prefeed pump (13) for pumping fuel out of the fuel supply container (12) into a low-pressure region (ND) of the fuel metering system (11), a high-pressure pump assembly having at least two high-pressure pumps (14, 15) for pumping fuel out of the low-pressure region (ND) into at least one common rail (16; 16', 16''), the control unit (22) for regulating an injection pressure (p_r) prevailing in the high-pressure reservoir (16; 16', 16''), and fuel injection valves (9) for injecting fuel out of the high-pressure reservoir (16; 16', 16'') into combustion chambers (4) of the engine (1), characterized in that the fuel metering system (11) has one fuel circuit for metering fuel into all the combustion chambers (4) of the engine (1), and all the high-pressure pumps (14, 15) are disposed in the fuel circuit, and that the control unit (22) triggers all the high-pressure pumps (14, 15) independently of one another via a common pressure regulating circuit.

14. The control unit (22) of claim 13, characterized in that the control unit (22) triggers the high-pressure pumps (14, 15) parallel to one another.

15. The control unit (22) of claim 13, characterized in that the control unit (22) triggers one or more first high-pressure pumps (14) oppositely from one or more second high-pressure pumps (15).

16. The control unit (22) of one of claims 13-15, characterized in that the control unit (22) triggers the high-pressure pumps (14, 15) with the same triggering time (T).

17. A control element, in particular a read-only memory (ROM) or flash memory, for a control unit (22) of a direct-injection internal combustion engine (1), in which a program is stored in memory that is capable of being run on a computer, in particular a microprocessor, and is suitable for performing a method of one of claims 1-4.